POSTEL

Network Working Group
Request for Comments: 1080

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November 1988

Telnet Remote Flow Control Option

Status of This Memo

This RFC specifies a standard for the Internet community. Hosts on the Internet that do remote flow control within the Telnet protocol are expected to adopt and implement this standard. Distribution of this memo is unlimited.

Motivation

This memo describes a method of remotely toggling flow control between a user telnet process and the attached terminal. Only flow control of data being transmitted from the telnet process to the terminal is considered. Many systems will also allow flow control of data from the terminal to the telnet process. However there is seldom need to change this behavior repeatedly during the session.

There are two common ways of doing flow control: hardware and software. Hardware flow control uses signals on wires dedicated for this purpose. Software flow control uses one or two specific characters sent along the same path as normal input data. Most commonly, XOFF (control-S) and XON (control-Q) are used to stop and start output, respectively. The option described herein is useful primarily where software flow control is being used. (Since hardware flow control does not preempt any characters, there is normally no need to disable it.)

The primary difficulty with software flow control is that it preempts one or two characters. Host software often requires the user to be able to input every possible ASCII character. (Certain editors are notorious for having XOFF and XON as commonly-used commands.) For this reason, operating systems often allow programs to disable flow control. While it is disabled, the characters that normally signal flow control may be read as normal input. In a telnet environment, flow control is normally done by the user telnet process, not by the host computer. Thus this RFC defines a way to propagate flow control status from the host computer to the user telnet process.

1. Command Name and Code

TOGGLE-FLOW-CONTROL

Code = 33

2. Command Meanings

IAC WILL TOGGLE-FLOW-CONTROL

Sender is willing to enable and disable flow control upon command.

IAC WON'T TOGGLE-FLOW-CONTROL

Sender refuses to enable and disable flow control. Nothing is implied about whether sender does or does not use flow control. It is simply unwilling to enable and disable it using this protocol.

IAC DO TOGGLE-FLOW-CONTROL

Sender is willing to send commands to enable and disable flow control.

IAC DON'T TOGGLE-FLOW-CONTROL

Sender refuses to send command to enable and disable flow control.

IAC SB TOGGLE-FLOW-CONTROL OFF IAC SE

Sender requests receiver to disable flow control. The code for OFF is 0.

IAC SB TOGGLE-FLOW-CONTROL ON IAC SE

Sender requests receiver to enable flow control. The code for ON is 1.

3. Default

WON'T TOGGLE-FLOW-CONTROL

Flow control information will not be exchanged.

DON'T TOGGLE-FLOW-CONTROL

Flow control information will not be exchanged.

4. Description of the Option

Use of the option requires two phases. In the first phase, the telnet processes agree that one of them will TOGGLE-FLOW-CONTROL. WILL and DO are used only in this first phase. In general there will be only one exchange of WILL and DO for a session. Subnegotiations must not be issued until DO and WILL have been exchanged. It is permissible for either side to turn off the option by sending a WONT or DONT. Should this happen, no more subnegotiations may be sent, unless the option is reenabled by another exchange of DO and WILL.

Once the hosts have exchanged a WILL and a DO, the sender of the DO TOGGLE-FLOW-CONTROL is free to send subnegotiations to enable and disable flow control in the other process. Normally, the sender of the DO will be a host, and the other end will be a user telnet process, which is connected to a terminal. Thus the protocol is normally asymmetric. However it may be used in both directions without confusion should need for this arise.

As soon as the DO and WILL have been exchanged, the sender of the WILL must enable flow control. This allows flow control to begin in a known state. Should the option be disabled by exchange of DONT and WONT, flow control may revert to an implementation-defined default state. It is not safe to assume that flow control will remain in the state requested by the most recent subnegotiation.

Currently, only two command codes are defined for the subnegotiations: flow control off (code 0) and flow control on (code 1). Neither of these codes requires any additional data. However it is possible that additional commands may be added. Thus subnegotiations having command codes other than 0 and 1 should be ignored.

Here is an example of use of this option:

Host1: IAC DO TOGGLE-FLOW-CONTROL

Host2: IAC WILL TOGGLE-FLOW-CONTROL

(Host1 is now free to send commands to change flow control. Note that host2 must now have enabled flow control.)

Host1: IAC SB TOGGLE-FLOW-CONTROL OFF IAC SE

Host1: IAC SB TOGGLE-FLOW-CONTROL ON IAC SE

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